



MORPHOLOGICAL STRUCTURE OF FOLLICLES AND OVA OF THE FEMALE BODY

Khalimova Yulduz Salokhiddinovna

Assistant of the Department of Fundamental Medicine,
Asian International University

<https://doi.org/10.5281/zenodo.14508750>

Annotation. The follicle and egg are key elements of the female reproductive system. They are closely related to each other and are involved in the processes of maturation, ovulation and reproduction. Their structure is carefully adapted to perform these functions.

Key words: Female reproductive system, Follicle, Primordial follicles, Egg, Cytoplasm, Granulosa cells.

The follicle is the structure of the ovary, inside which the egg cell matures. Follicles go through several stages of development:

1. Primordial follicles:

Are dormant from birth to the moment of activation.

They consist of an oocyte of the first order, surrounded by a single layer of flat follicular cells.

2. Primary follicles:

Flat cells turn into cubic cells, forming a layer of granulosa cells.

The egg cell increases in size and begins to secrete the pellucid zone — the glycoprotein membrane.

3. Secondary (preantral) follicles:

Several layers of granulosa cells are formed.

The outer shell — the tecal one — is differentiated into the inner (the tecal interna) and the outer (the tecal externa).

4. Tertiary (antral) follicles:

An antrum appears, a cavity filled with follicular fluid.

Granulosa cells form a radiant crown surrounding the oocyte.

5. Graaf's follicle:

This is a mature follicle ready for ovulation.

Contains a large oocyte of the second order, surrounded by a zone of pellucida and cells of the radiant crown.

After ovulation, the remainder of the follicle is transformed into the corpus luteum, which secretes hormones necessary to maintain pregnancy.

The egg

Egg (oocyte) It is one of the largest cells in the female body. Its structure is adapted to participate in fertilization and ensure the initial stages of embryo development.

1. Cytoplasm:

Contains nutrients and organelles necessary for the first divisions of the zygote.

Is enriched with mitochondria, which play a key role in providing the energy needs of the cell.

2. The core:

Is in the stage of meiosis. Before ovulation, the oocyte completes meiosis I and enters the stage of meiosis II, which ends only after fertilization.

3. The pellucid zone:

Glycoprotein membrane that protects the egg and ensures interaction with the sperm during fertilization.

4. Radiant crown:

Layer of granulosa cells surrounding the pellucid zone.

Provides nutrition to the egg and participates in its transportation through the fallopian tube.

The interaction of follicle and egg

The follicle provides the egg with protection, nutrition and the necessary hormonal signals during its maturation. In turn, the maturing egg cell secretes factors that affect the development of granulosa and theca follicle cells. This interaction ensures coordinated growth and development of the follicle up to the ovulation stage.

Morphology of eggs

The egg, or oocyte, is one of the largest cells in the body and plays a key role in the reproduction process. Its morphology is carefully adapted to perform its reproductive function, ensuring successful fusion with the sperm and the beginning of embryonic development.

General characteristics

The egg is a spherical haploid cell surrounded by several protective shells. Its size varies significantly depending on the type of organism, but in general it is much larger than most other cells in the body. Such a large structure is due to the need to accumulate nutrients and organelles to support early embryonic development.

The key characteristics of egg morphology are:

1. Cytoplasm: rich in organelles such as mitochondria, ribosomes, and numerous vesicles. It also contains reserves of nutrients (yolk) necessary for the development of the embryo before implantation.
2. Nucleus: contains a haploid set of chromosomes formed as a result of meiosis. Before fertilization, the nucleus is in the stage of completion of meiosis II.
3. Shells:

Pellucid zone: a glycoprotein shell that protects the egg from mechanical damage and provides specific interaction with the sperm.

Coronal radiate: a layer of follicular cells surrounding the pellucid zone and playing a role in the nutrition of the oocyte.

Morphological variations in different organisms

In different types of eggs, they differ in size, yolk content and shell structure. These differences are due to evolutionary adaptations and the type of embryo development.

1. Isolecital eggs: characteristic of mammals, contain evenly distributed yolk in small quantities.
2. Telolecital eggs: have a large yolk sac shifted to one of the poles of the cell (for example, in reptiles and birds).
3. Centrolecital eggs: contain a yolk in the central part, surrounded by a thin layer of cytoplasm (in insects).

Morphological changes in the process of ovulation and fertilization

During ovulation, the egg is released from the follicle and enters the fallopian tube. Its morphology ensures successful interaction with the sperm. After sperm penetration:

- A cortical reaction is triggered in the pellucid zone, preventing the penetration of other spermatozoa.
- Completion of meiosis II and formation of the female pronucleus occurs.
- Male and female pronuclei merge to form a zygote.

Conclusion

The structure of the follicle and egg demonstrates the complex biological architecture necessary to ensure the reproductive function of the female body. Their coordinated development plays a key role in maturation and fertilization, which makes them essential elements of the reproductive system.

The morphology of the egg is the result of complex evolution and is carefully tuned to perform a reproductive function. Its structure provides not only protection and interaction with the sperm, but also the accumulation of resources to maintain the early stage of development of a new organism.

Literature:

- 1.Халимова, Ю. С. (2021). MORPHOFUNCTIONAL ASPECTS OF THE HUMAN BODY IN THE ABUSE OF ENERGY DRINKS. Новый день в медицине, 5(37), 208-210.
- 2.Халимова, Ю. С. (2022). МОРФОФУНКЦИОНАЛЬНЫЕ ОСОБЕННОСТИ ЯИЧНИКОВ КРЫС ПРИ ВОЗДЕЙСТВИИ КОФЕИН СОДЕРЖАЩИХ НАПИТОК. Gospodarka i Innowacje., 23, 368-374.
- 3.Salokhiddinovna, X. Y. (2023). INFLUENCE OF EXTERNAL FACTORS ON THE MALE REPRODUCTIVE SYSTEM. EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE, 3(10), 6-13.
- 4.Халимова, Ю. С., & Шокиров, Б. С. (2022). МОРФОФУНКЦИОНАЛЬНЫЕ ОСОБЕННОСТИ ВНУТРЕННИХ ОРГАНОВ ПРИ ХРОНИЧЕСКОМ АЛКОГОЛИЗМЕ. Scientific progress, 3(2), 782-789.
- 5.Halimova, Y. S. (2023). Morphological Aspects of Rat Ovaries When Exposed to Caffeine Containing Drink. BEST JOURNAL OF INNOVATION IN SCIENCE, RESEARCH AND DEVELOPMENT, 2(6), 294-300.
- 6.Halimova, Y. S., Shokirov, B. S., & Khasanova, D. A. (2023). Reproduction and Viability of Female Rat Offspring When Exposed To Ethanol. Procedia of Engineering and Medical Sciences, 32-35.
- 7.Salokhiddinovna, H. Y. (2023). Morphological Features of the Human Body in Energy Drink Abuse. EUROPEAN JOURNAL OF INNOVATION IN NONFORMAL EDUCATION, 3(5), 51-53.
- 8.Халимова, Ю. С., & Шокиров, Б. С. (2022). СОВРЕМЕННЫЕ ДАННЫЕ О МОРФОФУНКЦИОНАЛЬНЫХ АСПЕКТАХ ЧЕЛОВЕЧЕСКОГО ОРГАНИЗМА ПРИ ЗЛОУПОТРЕБЛЕНИЕ ЭНЕРГЕТИЧЕСКИМИ НАПИТКАМИ. PEDAGOGS journali, 4(1), 154-161.
- 9.Halimova, Y. S. (2023). Morphofunctional Aspects of Internal Organs in Chronic Alcoholism. AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI, 2(5), 83-87.
10. Shokirov, B. S. (2021). Halimova Yu. S. Antibiotic-induced rat gut microbiota dysbiosis and salmonella resistance Society and innovations.

11. Халимова, Ю. С., & Шокиров, Б. С. (2021). Репродуктивность и жизнеспособность потомства самок крыс при различной длительности воздействия этанола. In Актуальные вопросы современной медицинской науки и здравоохранения: Материалы VI Международной научно-практической конференции молодых учёных и студентов, посвященной году науки и технологий, (Екатеринбург, 8-9 апреля 2021): в 3-х т.. Федеральное государственное бюджетное образовательное учреждение высшего образования «Уральский государственный медицинский университет» Министерства здравоохранения Российской Федерации.
12. Khalimova, Y. S. BS Shokirov Morphological changes of internal organs in chronic alcoholism. Middle European scientific bulletin, 12-2021.
13. Шокиров, Б. С., & Халимова, Ю. С. (2022). ДИСБИОЗ ВЫЗВАННЫЙ АНИБИОТИКАМИ КИШЕЧНОЙ МИКРОБИОТЫ КРЫС И УСТОЙЧИВОСТЬ К САЛМОНЕЛЛАМ. Scientific progress, 3(2), 766-772.
14. Salokhiddinovna, X. Y. (2023). Clinical Features of the Course of Vitamin D Deficiency in Women of Reproductive Age. EUROPEAN JOURNAL OF INNOVATION IN NONFORMAL EDUCATION, 3(11), 28-31.
15. Шокиров, Б., & Халимова, Ю. (2021). Антибиотик-индуцированный дисбиоз микробиоты кишечника крыс и резистентность к сальмонеллам. Общество и инновации, 2(4/S), 93-100.
16. Salokhiddinovna, X. Y. (2023). MORPHOLOGICAL CHANGES IN PATHOLOGICAL FORMS OF ERYTHROCYTES. EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE, 3(11), 20-24.
17. Saloxiddinovna, X. Y. (2023). ERITROTSITLAR PATOLOGIK SHAKLLARINING MORFOLOGIK O'ZGARISHLARI. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 33(1), 167-172.
18. Шокиров, Б., & Халимова, Ю. (2021). Antibiotic-induced rat gut microbiota dysbiosis and salmonella resistance. Общество и инновации, 2(4/S), 93-100.
19. Шокиров, Б. С., & Халимова, Ю. С. (2021). Пищеварительная функция кишечника после коррекции экспериментального дисбактериоза у крыс бифидобактериями. In Актуальные вопросы современной медицинской науки и здравоохранения: Материалы VI Международной научно-практической конференции молодых учёных и студентов, посвященной году науки и технологий, (Екатеринбург, 8-9 апреля 2021): в 3-х т.. Федеральное государственное бюджетное образовательное учреждение высшего образования «Уральский государственный медицинский университет» Министерства здравоохранения Российской Федерации.
20. Salokhiddinovna, X. Y. (2023). Anemia of Chronic Diseases. Research Journal of Trauma and Disability Studies, 2(12), 364-372.
21. Salokhiddinovna, X. Y. (2023). MALLORY WEISS SYNDROME IN DIFFUSE LIVER LESIONS. Journal of Science in Medicine and Life, 1(4), 11-15.
22. Salokhiddinovna, X. Y. (2023). SURUNKALI KASALLIKLARDA UCHRAYDIGAN ANEMIYALAR MORFO-FUNKSIONAL XUSUSIYATLARI. Ta'lim innovatsiyasi va integratsiyasi, 10(3), 180-188.
23. Халимова, Ю. С. (2024). КЛИНИКО-МОРФОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ВИТАМИНА D В ФОРМИРОВАНИЕ ПРОТИВОИНФЕКЦИОННОГО ИММУНИТА. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 36(3), 86-94.
24. Saloxiddinovna, X. Y. (2024). CLINICAL FEATURES OF VITAMIN D EFFECTS ON BONE METABOLISM. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 36(5), 90-99.

25. Saloxiddinovna, X. Y. (2024). CLINICAL AND MORPHOLOGICAL ASPECTS OF AUTOIMMUNE THYROIDITIS. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 36(5), 100-108.
26. Saloxiddinovna, X. Y. (2024). MORPHOFUNCTIONAL FEATURES BLOOD MORPHOLOGY IN AGE-RELATED CHANGES. Лучшие интеллектуальные исследования, 14(4), 146-158.
27. Saloxiddinovna, X. Y. (2024). CLINICAL MORPHOLOGICAL CRITERIA OF LEUKOCYTES. Лучшие интеллектуальные исследования, 14(4), 159-167.
28. Saloxiddinovna, X. Y. (2024). Current Views of Vitamin D Metabolism in the Body. Best Journal of Innovation in Science, Research and Development, 3(3), 235-243.
29. Saloxiddinovna, X. Y. (2024). MORPHOFUNCTIONAL FEATURES OF THE STRUCTURE AND DEVELOPMENT OF THE OVARIES. EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE, 4(4), 220-227.
30. Saloxiddinovna, X. Y. (2024). Modern Views on the Effects of the Use of Cholecalciferol on the General Condition of the Bod. JOURNAL OF HEALTHCARE AND LIFE-SCIENCE RESEARCH, 3(5), 79-85.
31. Халимова, Ю. С., & Хафизова, М. Н. (2024). МОРФО-ФУНКЦИОНАЛЬНЫЕ И КЛИНИЧЕСКИЕ АСПЕКТЫ СТРОЕНИЯ И РАЗВИТИЯ ЯИЧНИКОВ (ОБЗОР ЛИТЕРАТУРЫ). TADQIQOTLAR. UZ, 40(5), 188-198.
32. Халимова, Ю. С. (2024). Морфологические Особенности Поражения Печени У Пациентов С Синдромом Мэллори-Вейса. Journal of Science in Medicine and Life, 2(6), 166-172.
33. Xalimova, Y. S. (2024). Morphology of the Testes in the Detection of Infertility. Journal of Science in Medicine and Life, 2(6), 83-88.
34. Халимова, Ю. С., & Хафизова, М. Н. (2024). ОСОБЕННОСТИ СОЗРЕВАНИЕ И ФУНКЦИОНИРОВАНИЕ ЯИЧНИКОВ. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 55(2), 188-194.
35. Хафизова, М. Н., & Халимова, Ю. С. (2024). МОТИВАЦИОННЫЕ МЕТОДЫ ПРИ ОБУЧЕНИИ ЛАТЫНИ И МЕДИЦИНСКОЙ ТЕРМИНОЛОГИИ. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 55(2), 165-171.
36. Хафизова, М. Н., & Халимова, Ю. С. (2024). ИСПОЛЬЗОВАНИЕ ЧАСТОТНЫХ ОТРЕЗКОВ В НАИМЕНОВАНИЯХ ЛЕКАРСТВЕННЫХ ПРЕПАРАТОВ В ФАРМАЦЕВТИКЕ. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 55(2), 172-178.
37. Saloxiddinovna, X. Y., & Ne'matillaevna, X. M. (2024). FEATURES OF THE STRUCTURE OF THE REPRODUCTIVE ORGANS OF THE FEMALE BODY. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 55(2), 179-183.
38. Халимова, Ю. С., & Хафизова, М. Н. (2024). КЛИНИЧЕСКИЕ АСПЕКТЫ ЛИЦ ЗЛОУПОТРЕБЛЯЮЩЕЕСЯ ЭНЕРГЕТИЧЕСКИМИ НАПИТКАМИ. TADQIQOTLAR. UZ, 40(5), 199-207.
39. Халимова, Ю. С., & Хафизова, М. Н. (2024). КЛИНИЧЕСКИЕ ОСОБЕННОСТИ ЗАБОЛЕВАНИЙ ВНУТРЕННИХ ОРГАНОВ У ЛИЦ, СТРАДАЮЩИХ АЛКОГОЛЬНОЙ ЗАВИСИМОСТЬЮ. TADQIQOTLAR. UZ, 40(5), 240-250.
40. Халимова, Ю. С., & Хафизова, М. Н. (2024). кафедра Клинических наук Азиатский международный университет Бухара, Узбекистан. Modern education and development, 10(1), 60-75.

- 41.Халимова, Ю. С., & Хафизова, М. Н. (2024). МОРФО-ФУНКЦИОНАЛЬНЫЕ И КЛИНИЧЕСКИЕ АСПЕКТЫ ФОРМИРОВАНИЯ КОЖНЫХ ПОКРОВОВ. Modern education and development, 10(1), 76-90.
- 42.Nematilloevna, K. M., & Salokhiddinovna, K. Y. (2024). IMPORTANT FEATURES IN THE FORMATION OF DEGREE OF COMPARISON OF ADJECTIVES IN LATIN. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 55(2), 150-157.
- 43.KHALIMOVA, Y. S. (2024). MORPHOFUNCTIONAL CHARACTERISTICS OF TESTICULAR AND OVARIAN TISSUES OF ANIMALS IN THE AGE ASPECT. Valeology: International Journal of Medical Anthropology and Bioethics, 2(9), 100-105.
- 44.Salokhiddinovna, K. Y., Saifiloevich, S. B., Barnoevich, K. I., & Hikmatov, A. S. (2024). THE INCIDENCE OF AIDS, THE DEFINITION AND CAUSES OF THE DISEASE. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 55(2), 195-205.
- 45.Нарзуллаева, У., Самиева, Г., & Пардаева, З. (2022). ПАТОФИЗИОЛОГИЯ РЕПЕРФУЗИОННОГО ПОВРЕЖДЕНИЯ МИОКАРДА. Журнал вестник врача, 1(2), 155-158. <https://doi.org/10.38095/2181-466X-2020942-154-157>
- 46.Самиева, Г., Нарзуллаева, У., & Самиев, У. (2023). Течение артериальной гипертензии у жителей засушливого региона. Каталог монографий, 1(1), 1-108. извлечено от <https://inlibrary.uz/index.php/monographs/article/view/27456>
- 47.Oripova, O. O., Samieva, G. U., Xamidova, F. M., & Narzulaeva, U. R. (2020). Sostoyanie plotnosti raspredeleniya limfoidnykh kletok slisistoy obolochki gortani va proyavleniya mestno immuna pri xroncheskom laringite (tahlil seksionnogo material). Akademiya,(4 (55)), 83-86.
- 48.Rakhmatulloevna, N. U., & Abdurasulovna, B. M. (2022). GEMOREOLOGIK BUZILISHLAR VA ERITROTSITLAR AGREGATSION XOSSALARI O'ZGARISHINING PATOGENETIK MEKANIZMLARI. JOURNAL OF BIOMEDICINE AND PRACTICE, 7(6).
- 49.Saidova, L. B., & Ergashev, G. T. (2022). Improvement of rehabilitation and rehabilitation criteria for patients with type 2 diabetes.
- 50.Эргашева, Г. Т. (2023). Изучение Клинических Особенности Больных Сахарным Диабетом 2 Типа Среднего И Пожилого Возраста. Central Asian Journal of Medical and Natural Science, 4(6), 274-276.
- 51.Toxirovna, E. G. (2023). O'RTA VA KEKSA YOSHLI BEMORLARDA 2-TUR QANDLI DIABET KECHISHINING KLINIKO-MORFOLOGIK XUSUSIYATLARI. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 33(1), 164-166.
- 52.Ergasheva, G. T. (2022). QANDLI DIABET BILAN KASALLANGANLARDA REABILITATSIYA MEZONLARINI TAKOMILASHTIRISH. TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI, 2(12), 335-337.
- 53.Ergasheva, G. (2024). METHODS TO PREVENT SIDE EFFECTS OF DIABETES MELLITUS IN SICK PATIENTS WITH TYPE 2 DIABETES. Журнал академических исследований нового Узбекистана, 1(2), 12-16.
- 54.ГТ, Э., & Саидова, Л. Б. (2022). СОВЕРШЕНСТВОВАНИЕ РЕАБИЛИТАЦИОННО-ВОССТАНОВИТЕЛЬНЫХ КРИТЕРИЕВ БОЛЬНЫХ С СД-2 ТИПА. TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI, 2(12), 206-209.
- 55.Abdurashitovich, Z. F. (2024). Department of Syndesmology from the Science of Human Anatomy General Information About. Research Journal of Trauma and Disability Studies, 3(3), 158-165.

- 56.Abdurashitovich, Z. F. (2024). THE COMPLEXITY OF THE FUSION OF THE BONES OF THE FOOT. JOURNAL OF HEALTHCARE AND LIFE-SCIENCE RESEARCH, 3(5), 223-230.
- 57.Abdurashitovich, Z. F. (2024). MUSHAKLAR TO'GRISIDA MA'LUMOT. MUSHAKLARNING TARAQQIYOTI. MUSHAKLARNING YORDAMCHI APPARATI. TADQIQOTLAR. UZ, 40(3), 94-100.
- 58.Abdurashitovich, Z. F. (2024). APPLICATION OF MYOCARDIAL CYTOPROTECTORS IN ISCHEMIC HEART DISEASES. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 39(5), 152-159.
- 59.Abdurashitovich, Z. F. (2024). SIGNIFICANCE OF BIOMARKERS IN METABOLIC SYNDROME. EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE, 4(9), 409-413.